



WORLD
RESOURCES | ROSS
INSTITUTE | CENTER



On the Move: Realizing the Promise of Public Transportation

THE MOBILITY AND ACCESSIBILITY PROGRAM

Sponsored by **FedEx**®

Reimagining How Cities Move

The Mobility and Accessibility Program (MAP), a dynamic collaboration between FedEx and WRI Ross Center for Sustainable Cities, is helping to transform major public transportation systems across the world, making them safer, more efficient and more sustainable for millions of users.

As megacities from Mexico City to Beijing contend with intense congestion, pollution and sprawl, our work is seeding positive change: reducing carbon emissions, increasing pedestrian and road safety, and delivering more reliable, affordable service. Better mobility and accessibility help people take advantage of opportunities in jobs, education and the marketplace, building more equitable societies and more productive local economies.

Together, FedEx and WRI Ross Center for Sustainable Cities are catalyzing public transportation solutions where they are needed most.

Our Collective Impact

Since 2012, MAP has:

Benefited **18 million people** through a range of projects focused on improving mass transport, such as the expansion of bus rapid transit and quality of service improvements, while providing additional indirect benefits to tens of millions

Helped cities in the developing world prevent more than **1 million metric tons** of carbon emissions

Trained more than **10,000 bus operators** on "Safety First" principles

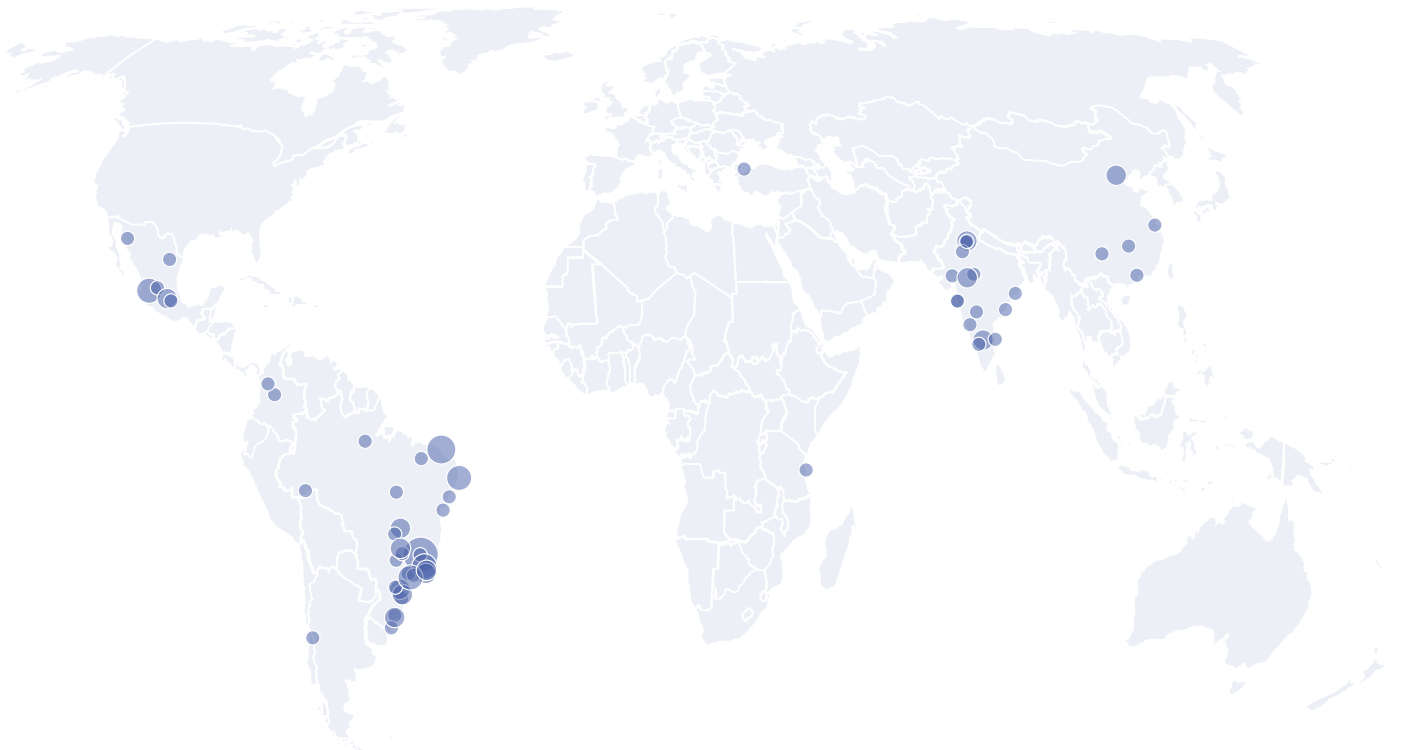
Collaborated with transport officials, policy makers and governments in **68 cities and 8 countries**

Facilitated the adoption of mass transit service metrics to improve the quality of transit in more than **30 cities**

Shared FedEx technical expertise with thousands of professionals through in-person engagement

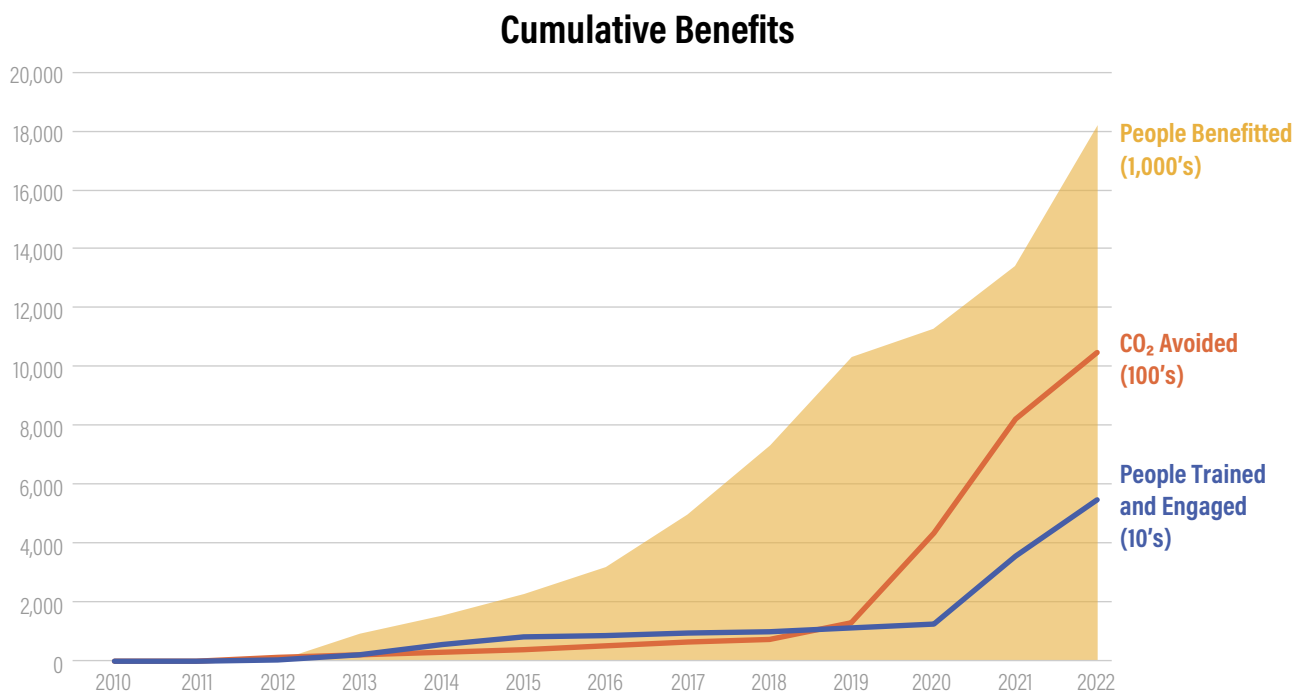
Influenced public investment in transportation operations and infrastructure on three continents

● The size of the dots represents the number of projects in each city.



A Strong Foundation Has Led to Escalating Benefits

More than half of the total People Benefited have been reached in the last three years. Similarly, CO₂ avoidance and People Trained and Engaged has scaled up significantly. As evident by the chart below, with steady FedEx funding, WRI has been able to build on the momentum from the strong foundation to ultimately see exponential benefits.



BENEFITS BY COUNTRY

Country	People Benefited	People Trained & Engaged	CO ₂ Avoided (Tons)
Brazil	6,995,910	16,121	33
China	6,321,000	16,105	964,669
India	3,239,483	22,253	9,537
Mexico	1,485,793	2,757	70,000
Global	732	546	-
Grand Total	18,042,186	57,782	1,044,239

Letter From the Director

Marking a decade of impacts through MAP, this report is a reflection on FedEx and the World Resources Institute's shared accomplishments and vision. As you will read in the following pages, it is the story of how a new model for corporate social responsibility, coupled with world-class research and government action, is changing public transportation in cities across the planet.

MAP helps deliver solutions that save millions of people time and money, ease congestion, create safer streets, reduce pollution and make access to jobs, education and markets more equitable. From Asia to Latin America, the program combines the technical expertise of FedEx with WRI's research and implementation, working with urban planners and policymakers around the world to make transit systems better for everyone.

This process first took root in Mexico City and has expanded to China, India and Brazil, thanks to strong support from FedEx. Our partnership, which has been recognized as a corporate citizenship best practice, goes beyond funding to include active knowledge sharing, site visits and engagement with young transportation professionals to develop the next generation of leaders.

Today, MAP's mission to transform public transportation is more critical than ever. During the global COVID-19 pandemic, transit systems suffered severe losses in ridership, and the effects continue to batter operations and revenues. We know that efficient, sustainable

transportation is essential if the world is to meet its climate and sustainable development goals, but the reality is daunting: only 52% of the global urban population has safe and convenient access to public transport.

To meet the challenge, MAP teams work on four fronts: optimizing efficiency, electrifying fuels, integrating transit systems, and aligning funding and policy. By convening diverse stakeholders, including transit agencies, researchers, policymakers, government officials and residents, and prioritizing equity, MAP is finding solutions that improve mobility, provide access to jobs and services, and boost quality of life. The outcomes, summarized here, illustrate the sizable return on FedEx investment.

Through MAP, FedEx has enabled WRI – and scores of cities – to go farther and faster on one of the biggest issues facing our world. We are grateful for the partnership and look forward to building on our record of achievement in the decade to come.

Sincerely,



Rogier van den Berg

Global Director

WRI Ross Center for Sustainable Cities

Connecting people and possibilities through better public transportation



“We chose to work with WRI because they’re more than a think tank. They offer not only analysis, but boots on the ground in the developing world. It’s a proving ground for ideas that then get expanded – a chance to translate thought into action.”

Mitch Jackson

Chief Sustainability Officer, FedEx



“This innovative partnership has already transformed dozens of cities. FedEx is setting a new standard for corporate social responsibility by leveraging its expertise to help WRI improve the lives of millions of people across the world.”

Ani Dasgupta

President & CEO, WRI



MAP contributes to many of the Sustainable Development Goals, such as climate action, building sustainable cities and communities, reduced inequalities, and creating strong partnerships.

How We Work

WRI uses the Avoid-Shift-Improve framework to promote sustainable urban transport: avoid unnecessary trips, shift to more sustainable transport modes and improve performance in all modes. Through our partnership with FedEx, we have expanded our activities in all three areas.

Cities are centers of opportunity and innovation – and they’re booming. As urban areas expand at unprecedented rates, transportation solutions that can enhance access, mitigate congestion, elevate safety and improve air quality are vital.

Over the past decade, FedEx and WRI have joined forces to help cities achieve these goals and meet the world’s growing demand for reliable mobility services. By combining our mutual expertise, MAP has delivered results that have enhanced the quality of transport for everyone: faster journeys, more reliable systems, less pollution and safer practices.

Our global collaboration across nearly 70 cities and three continents has directly impacted nearly 18 million people to date, with even more on the horizon.

MAP leverages the extensive know-how of FedEx, including expertise in vehicle patterns, fuels, transportation technology and driver safety, by merging it with the innovative research and extensive global network of WRI Ross Center for Sustainable Cities. The results are effective, on-the-ground solutions that work at the local level and can be scaled up for even greater impact.

Public bus systems, the world’s leading mode of public transport, are a particular focus of MAP because they account for 63% of total public transportation usage – higher than the sum of all other modes combined. Making them an easier, cleaner, more affordable choice aligns with core FedEx corporate values: to help residents and

businesses access markets and services, boost employment and improve standards of living in their communities – all in ways that reduce environmental impact and deliver a more sustainable future.

Mitch Jackson, Chief Sustainability Officer at FedEx, invited WRI to partner with the corporation in 2010. “We had four goals,” he recalled. “Environmental concerns were first and foremost, but we also wanted to improve mass transit, elevate safety and reduce congestion in commercial centers, because if workers can’t get around, competitiveness diminishes.”

“The FedEx emphasis on quality was there as a foundational element, although it wasn’t one of the focus areas,” Jackson noted. “But in all the cities where MAP works, Quality Driven Management (QDM) has turned out to be a major opportunity for improvement.”

Jackson describes the company’s relationship with WRI as targeted philanthropy. “We provide not just funding, but our expertise,” he said. **To date, more than 100 FedEx team members have shared their knowledge of electric vehicles, asset management and QDM with WRI teams to help devise solutions for more efficient systems.**

FedEx team members also support the FedEx Fellowship program, where selected candidates from WRI – more than 25 to date – travel to Memphis for intensive one-week sessions on quality of service and efficient operations.

In just 10 years, MAP has helped to create game-changing transport innovations like **Mexico City’s bus rapid transit (BRT) routes, Beijing’s zero-emission zone and India’s new national plan to purchase 50,000 e-buses.** Thanks to bedrock support from FedEx, these actions are changing the transportation landscape.

	FUNDING	CO ₂ AVOIDED (TONS)	PEOPLE BENEFITTED	PEOPLE TRAINED & ENGAGED	
2010	\$551,500		110		FedEx and WRI's EMBARQ program begin a relationship focused on sustainable mobility
2011	\$712,500		77		Initial funding supports a vehicle and fuels project for the Metrobus system in Mexico City The first class of Fellows travels to Memphis to meet with FedEx team members
2012	\$737,500	10,000	424	138	MAP expands to India with Bus Karo
2013	\$886,655	10,000	920,968	1,886	Satisfaction Surveys are first launched in Brazil For the first time MAP benefits almost 1 million people, primarily through the Safety First programs in Mexico and Brazil
2014	\$800,000	10,000	600,665	3,500	In Brazil, MAP's BRT Day One program ensures smooth operations on a new BRT line's first day of service, benefitting 600,000 riders EMBARQ becomes the WRI Ross Center for Sustainable Cities, reflecting an expanded mission beyond transportation
2015	\$740,000	10,000	730,735	2,524	Fare integration in India leads to cost savings for half a million transit riders
2016	\$850,007	12,574	950,161	620	
2017	\$840,581	11,334	1,749,834	601	Evolving from QDM principles inspired by FedEx, QualiOnibus enrolls ten member cities in Brazil
2018	\$859,433	10,685	2,289,911	4,094	WRI and FedEx collaborate on the Better Bus Challenge in India, offering winning entrepreneurs \$50k and mentorship for transit innovations

	FUNDING	CO ₂ AVOIDED (TONS)	PEOPLE BENEFITTED	PEOPLE TRAINED & ENGAGED	
2019	\$1,050,351	54,914	3,009,457	1,161	<p>QualiOnibus has:</p> <ul style="list-style-type: none"> - 14 member cities - 10,000 Satisfaction survey respondents - Represents 17.5 million Daily Transit trips <p>After a devastating earthquake in Mexico City, MAP teams help the city develop its first-ever emergency protocol for a seismic event.</p>
2020	\$1,000,000	304,114	961,421	930	<p>The start of the COVID-19 pandemic reshapes daily travel. Public transit ridership drops 30%-60%</p> <p>MAP activities regroup and pivot to accommodate changing circumstances. Projects related to digital fare payments impact 600,000 riders.</p> <p>MAP tools and policies help shift trips in China away from private vehicles, leading to more than 300,000 lbs of CO₂ avoided.</p>
2021	\$1,000,000	389,739	2,134,942	23,100	<p>MAP engagement skyrockets as digital training sessions increase. More than 17,000 people engage directly with a MAP project</p>
2022	\$1,100,000	222,879	4,693,481	19,228	<p>Supported by Bus Karo, India's government announces a national policy to put 50,000 electric buses into use by 2030</p> <p>MAP issues a proposal for a new national financing program for public transportation in Mexico, in response to severe losses during the pandemic.</p> <p>Municipal transportation contracts across Brazil start to require the submission of customer satisfaction indicators—a direct result of MAP's emphasis on quality service.</p> <p>QualiOnibus in Brazil reaches 30 members.</p>
TOTAL	\$11,128,527	1,044,239	18,042,186	57,782	

Brazil

Sharing Solutions for Customer Satisfaction

Since its beginnings in Brazil in 2013, MAP has united more than 30 cities across the country in a common mission: **to deliver high-quality customer experiences for urban public transport users.** The FedEx focus on QDM has been integral to this mission. In a country of 210 million people, where buses account for almost 90% of all public transport use, MAP's continuous drive for better service helps to boost ridership and increase revenue. More importantly, it expands social equity and economic opportunity for everyone.

In just five years, the QualiÔnibus Benchmarking Group, created and convened by MAP, has spurred innovations to improve Brazil's public transportation. It's helped transit agencies in major cities like Rio de Janeiro, Belo Horizonte, Salvador, Porto Alegre and others to measure their performance by using standardized tools like quality indicators and customer satisfaction surveys — based on FedEx metrics — to establish benchmarks for service. QualiÔnibus member cities apply those tools to pinpoint areas for improvement and to identify potential solutions. They share their

experiences with the larger group so that other members can benefit.

The ripple effects are already evident. FedEx-inspired customer surveys have now been mandated by city governments in both Porto Alegre and Salvador, which canvas riders once a year to measure public perceptions of transit service and monitor progress. Administrators will work with the MAP team to conduct the surveys, analyze results and pinpoint opportunities for improvement.

The QualiÔnibus group has proven its value as a conduit for transportation solutions that can be shared across the country. A low-cost safety measure developed in Fortaleza, for instance, reduced accidents in its bus terminals dramatically with “safety stickers” on the buses that indicated the driver's blind spot and warned passing pedestrians and cyclists to avoid the space. Just three months later, dangerous collisions had dropped by 60%. Once the strategy was communicated through QualiÔnibus, São Paulo, Belo Horizonte, Salvador,

2013

MAP launches in Brazil with the first passenger satisfaction surveys conducted in Curitiba and Belo Horizonte

2015

Belo Horizonte's BRT system reduces the average bus commute time by 50% and increases user satisfaction by 60%, with 15% of riders shifting to the BRT from private vehicles. Rio de Janeiro's improved BRT system triples customer satisfaction rates

2017

QualiÔnibus Benchmarking Group launches with 10 participant cities/agencies



Cristina Albuquerque addresses the QualiÔnibus Fifth Anniversary meeting in Salvador. The association has grown to 30 cities and agencies, representing 16.5 million daily public transit riders.



Having a long-term relationship with FedEx is essential for our impact on the ground. It gives us room for planning, finding opportunities, developing our networks across the country and setting goals for the future

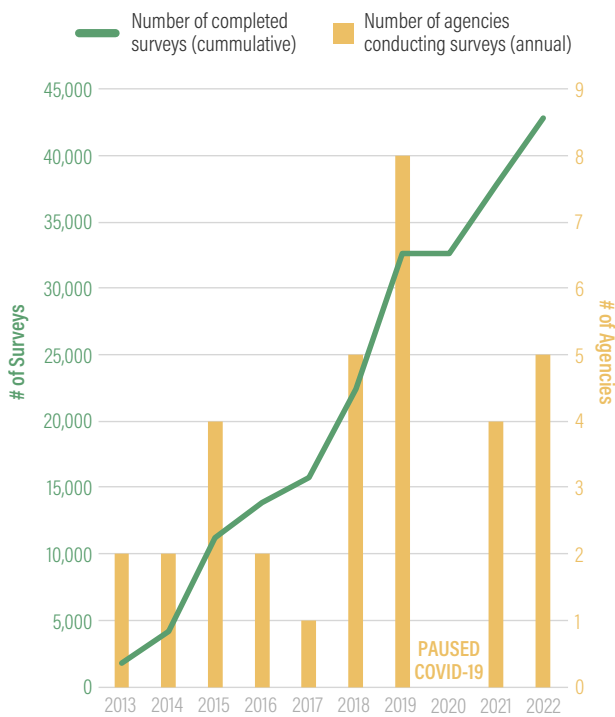
CRISTINA ALBUQUERQUE
Global Electric Mobility Director, WRI Brasil

Campos dos Goytacazes, Recife and Porto Alegre adopted it with similar results. Even cities outside the group’s umbrella were inspired, and the stickers are now found in Maceió, Diadema and Jundiaí.

In Belo Horizonte, MAP identified a ground-breaking public-private plan to fund upgrades to bus shelters by selling advertising rights – a solution shared among the group and adopted by Porto Alegre and Fortaleza. In Curitiba, we helped city agencies respond to personal safety concerns on transit, leading to a greater security presence, sexual abuse prevention campaigns and improved lighting.

In a targeted effort to make transit more efficient, more comfortable and better utilized, MAP helps Brazilian cities listen to customers and put quality first.

Satisfaction Surveys in Brazil



QualiÔnibus Participants: 10 14 20 25 30

Evolving from a Satisfaction Survey project begun in 2013, QualiÔnibus launched in 2017 with 10 member cities. To date, nearly 45,000 surveys have been completed. The results are used by member agencies to track and identify quality of service elements.

2019

Through QualiÔnibus, Fortaleza supports women’s safety with an app to report harassment on public transit while its “safety sticker” program indicating blind spots becomes the first best practice to be replicated in other cities

2022

QualiÔnibus membership reaches 30 agencies

China

Making Transportation Greener

For the past 10 years, the MAP program in China has been a leading proponent of innovative approaches to reduce carbon emissions and improve the efficiency of transit systems. We've supported ground-breaking initiatives in major cities across the country: the electrification of buses, new applications for big data and digital platforms that give customers new options for payment and real-time service updates.

MAP's focus on the adoption of e-buses, an effort that began with an e-bus study tour for WRI-FedEx fellows in 2017, has already had an extraordinary impact. The city of Shenzhen, near Hong Kong, shows the results. After working closely with the MAP team for more than three years, Shenzhen electrified 100% of its bus fleet in 2019. The purchase of more than 200 new electric vehicles

was part of the launch of a new, 28-kilometer BRT system, which MAP experts also guided.

Today, Shenzhen's transit system is providing faster, cheaper and more efficient bus service for more than 3.1 million daily riders. The electrification of the Shenzhen Bus Group's fleet is estimated to save 194,000 tons of carbon dioxide (CO₂) annually, while greatly reducing the city's air pollution emissions. It's a potent example of MAP's work and a visible demonstration of the value of e-buses for other metropolitan areas.

One of the most significant FedEx tools used in China has been customer satisfaction surveys, which the MAP team has helped to organize in five cities. Municipal transport agencies from Suzhou to Zhuzhou are acting on this feedback to pinpoint

2016

MAP collaborates with Zhuzhou, a city of 1.2 million, on the development of a new BRT system with e-buses, utilizing customer surveys and FedEx models to demonstrate operating efficiencies

2019

Shenzhen electrifies 100% of its bus fleet after three years of consultation with MAP



An electric bus goes by in Beijing, China.

Like many cities in China, we face major traffic congestion, and it's an important topic for us. Through the platform provided by FedEx and WRI, we've benefited from the international experiences of other transit planners, who provide good concepts and ideas for the development of public transportation

ZHENG BINGHUA
Deputy Director, Suzhou Transit Bureau

weaknesses and inform long-range planning, and they're igniting change at the national level: In 2021, China's national Ministry of Transport incorporated the use of customer satisfaction indicators into its Five-Year Transit Metropolis work plan.

Through a three-year, public-private initiative starting in 2015, MAP has helped 25 cities use data from transit smartcards and bus GPS readings to deliver precise numbers on passenger volume, station usage and vehicle headways and speeds – all key indicators for transportation planners to improve bus service quality.

MAP in China has grown to support influential MaaS pilots in Beijing and Guangzhou, exploring how shared mobility (car sharing and bike sharing) and mass transport can be combined to reduce emissions and promote sustainable transportation. By offering travel planning, discounts and payment options, it meets users' needs for simplicity and provides efficient, low-carbon travel solutions. To date, MaaS innovations in this pilot have nudged approximately 4.5 million people towards sustainable modes, avoiding 220,000 tons of CO2 emissions. Twenty Chinese cities have added MaaS to their master transportation plans for the next five to ten years.

2021

Thanks to a MAP pilot, China's Ministry of Transport incorporates the use of customer satisfaction indicators into its national Five-Year Transit Metropolis work plan

2022

MAP helps to introduce Mobility-as-a-Service (MaaS) programs that nudge more than 4.5 million users towards greener travel modes

India

Modernizing Bus Systems in Megacities

In India, where urban areas are expanding dramatically, municipal services struggle to keep pace. The demand for efficient, sustainable public transportation has never been higher, especially via bus systems, the country’s leading mode of travel. Transit agencies and administrators are searching for solutions that can deliver high-quality service, fuel savings and lower emissions, and quickly.

MAP’s Bus Karo (Hindi for “Do the Bus”) program, now in its tenth year, is meeting their needs. Now active in 63 cities in India, it’s a thriving peer-to-peer learning group for transit professionals that grapple with a host of issues, including fleet operations, technology adoption, business models, data analytics, policy, finance and more. Bus Karo shares best practices and new approaches widely among its members, who meet quarterly to discuss what’s working, what’s not and what tools are available to address their problems. Many of these tools come directly from FedEx, and WRI’s network carries them across the subcontinent.

In 2015, the Bengaluru Metropolitan Transportation Corporation asked Bus Karo for help in restructuring an outdated fare structure.

Together, we devised a simpler, more equitable payment system that set fares according to the distance traveled, eliminated penalties for transfers and charged less for shorter rides on heavily traveled corridors. Once it was put in place, more than 416,000 customers – one-third of all riders – pocketed savings as their fares decreased. Now, the MAP team is applying that experience at the state level, with a bigger partner: the North West Karnataka Road Transport Corporation. Through this initiative, riders can purchase a single ticket for one full journey, which reduces the cost of travel and encourages better trip planning.

To make buses a more attractive option in the capital, the Bus Karo team planned and optimized 17 new bus routes for Najafgarh, a suburb of Delhi, in 2020. The impact was immediate: a 17% increase in ridership (11,000 more passenger trips a day), a 19% increase in earnings per kilometer and improvements in on-time service.

Bus Karo has also been a key player in the movement to electrify India’s bus fleets. In 2022, after four years of consultation with MAP experts, administrators and agency officials, efforts

2012

MAP’s Bus Karo program begins

2015

Based on advice from MAP experts, fare integration in Bangalore leads to cost savings for nearly half a million riders

2018

The Better Bus Challenge, an incubator for transit start-ups, helps young entrepreneurs build solutions for bus service challenges



Women commute from work, school and errands on an afternoon bus in Bengaluru.



FedEx support, knowledge and guidance have played a big role in our success. Their enthusiasm has kept the flame alive in our teams. It couldn't be more crucial at this moment, when cities across India are making a major transition to electric fleets.

MADHAV PAI
CEO, WRI India

culminated in a major advance: the deployment of 5,450 e-buses in Delhi, Bengaluru, Hyderabad, Kolkata and Surat. **The national government has now announced a goal of having 50,000 e-buses in operation by 2030.**

To encourage innovation and bring new solutions to market – a value shared by FedEx – Bus Karo launched a competition in 2018 that offered young entrepreneurs the chance to earn funding for transportation fixes. The Better Bus Challenge, created with matching federal funds, offered startups a seat at the table with transit officials, where they pitched a range of solutions.

The three winning firms used prize grants of US\$50,000 each to roll out pilots in Mumbai, Karnataka and Bengaluru, demonstrating solid gains in service and technology. Their projects included converting diesel engines to electric, installing filters in tailpipes to reduce pollution and establishing a new bus line with an online

reservation system. The winner of the Better Bus Challenge, the Chartr App, is now part of the Delhi One App, which allows better integration among several government programs, including public transit.

Through this initiative, innovative solutions tailored to cities' needs have become part of their operational systems. The next Better Bus Challenge, slated for 2023, will focus on e-buses to realize a new crop of solutions for India's transportation transformation.

Now the world's most populous nation, India is the planet's third-largest greenhouse gas emitter. Its bus systems serve **more than 70 million people a day.**

With e-buses now recognized as a breakthrough climate solution, India's national government has announced it will put 50,000 into use by 2030.

2021

MAP co-develops the Chartr App, which brings digital ticketing to almost 1 million people in New Delhi and provides free rides for women

2022

Fuel efficiency for bus fleets in seven Indian cities rises 75% from 2012

Mexico

Upgrading Systems, Reducing Congestion

Mexico went from no BRT to more than 500km of routes in less than 20 years. Since 2012, MAP has provided planning advice on nine lines and 10 corridors to cities and the federal government.

Over the past ten years, Mexico City has taken major strides toward re-shaping its public transportation system – an essential step in enabling more than 21 million residents to move around the highly congested capital. **Today, Metrobus transports 1,500,000 passengers daily.** Through long-term collaborations with transit agencies, critical infusions of data, research and analysis, MAP has helped the city realize game-changing improvements that have **cut travel times for commuters in half and encouraged 17% of the population to shift from cars to public transport.**

A prime example is Guadalajara’s BRT system, which opened its newest line in 2022. The MAP team was closely involved in creating this new, 28-km network of bus-only lanes. We provided support on planning, technical issues, negotiations and implementation – everything from technical guidance on procuring e-buses to the design of revamped stations.

WRI’s early participation in Mexico City’s Metrobus Project (through EMBARQ in 2010-2014) focused on the planning and implementation of BRT and led to MAP’s formative role with the BRT. Since then, with FedEx support, we have been involved in more than 15 broad initiatives and dozens of people-centric projects to improve mobility, increase opportunities, ease congestion and make roads safer. These efforts have had wide-reaching positive effects on issues like air quality, transit-oriented development, active mobility, integrated urban and territorial planning, resource efficiency and electromobility.

Road safety was an early priority in MAP’s portfolio. With FedEx input, we helped Mexico City institute Safety First, a program that trains bus operators and advises on policies and international safety best practices. It draws on performance indicators, accident analysis, research and continuous improvement programs to increase driver awareness. MAP’s defensive driving program for Metrobus has trained over 1,300 drivers to date.

Since 2017, MAP has extended its outreach beyond the capital to major cities like Guadalajara and

2010-11

A collaboration between WRI and FedEx on Mexico City’s Metrobus kicks off MAPs

2014

1,015 Mexico City Metrobus drivers receive training in road safety procedures

2018

Ridership of Metrobus reaches 1.5 million people daily, with MAP providing highly specialized technical support on system development



Mexico City's MetroBus serves more than 1.5 million passengers daily.



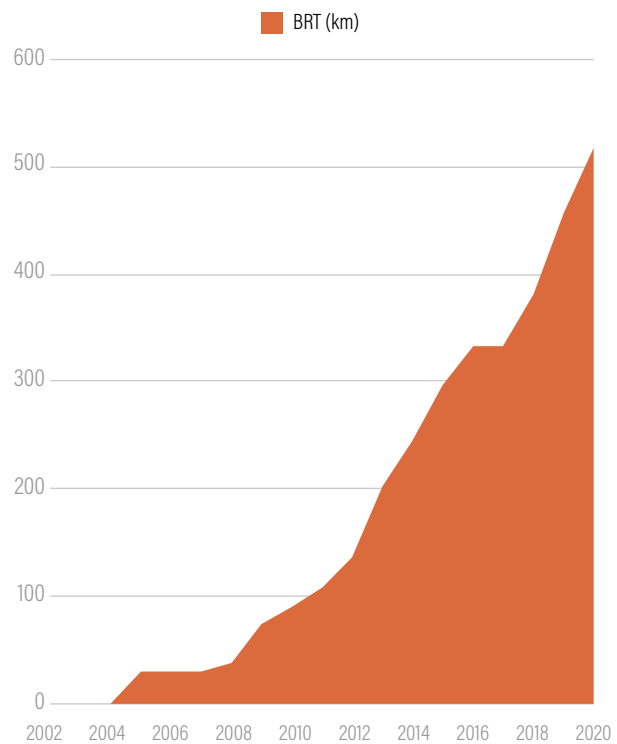
FedEx funding has been instrumental in improving public transportation in Mexico. Without it, there would have been far fewer technical resources to guide planning and operations for the capital's new BRT system, no road safety analysis required for infrastructure and no firm national commitment to improve service quality.

JOSE JUAN HERNANDEZ
WRI México Ross Center for Sustainable Cities

Leon, which has contributed to MAP's growing influence at the national level. Our experts have worked with the federal government to create a new technical and financial Support Program for Mass Transportation (PROTRAM), establish national road safety and public transport policies, and propose a National Public Transport Policy that promotes better management, operation, financing and renewal of vehicle fleets in municipal transportation systems across the country. Meanwhile, a nationwide association of local mobility authorities, AMAM, which MAP helped organize in 2017, is a prime catalyst in moving the country toward improvements in mobility and public transportation.

In the decade ahead, MAP's growing influence in other Latin American countries, including Colombia, will continue to inspire solutions for better mobility and quality public transportation.

Kilometers of BRT in Mexico: 2002-2020



Mexico went from no BRT to more than 500km of routes in less than 20 years. Since 2012, MAP has provided planning advice on nine lines and 10 corridors to cities and the federal government.

2022

Guadalajara opens the newest line of Macrobus, its BRT system, now serving 320,000 people a day

2023

MAP works nationally through the 21-city Mexican Association of Mobility Authorities (AMAM) to advocate for federal action on transit finance and road safety

FedEx-WRI Fellowship Program

Developing Transportation Professionals

In addition to our work with local and national governments, MAP sponsors the FedEx-WRI Fellowship program, founded in 2012. Selected candidates from WRI – more than 25 to date – travel to Memphis for intensive one-week sessions that reflect on the FedEx commitment to quality service and efficient operations. Fellows establish personal relationships that allow them to learn from one another and build on each other's successes. Like WRI experts everywhere, alumni disseminate transportation solutions across an international network so they can be adopted by other cities. Here are two of their stories:



Cristina realized that the QDM principles and processes she studied as a fellow could be applied to challenges that BRT systems across Brazil faced: Each agency used different metrics, methodologies and processes for making system improvements, hindering their ability to learn from other cities and to have a common frame of reference across the country. QDM provided a methodology that could work across every agency and quickly became the foundation for the QualiÔnibus program, launched in six Brazilian cities in 2016.

Their goal was to create a QDM-like framework for bus transit agencies throughout the country, based on factors such as reliability, access, travel times, comfort, safety and communications. Professionals embraced the concept immediately, and today QualiÔnibus includes 30 Brazilian bus-transit agencies and has a waiting list.



Lu Lu, a 2017 FedEx-WRI fellow from China, joined a study tour on e-buses during her visit to Memphis and later applied her knowledge in the city of Shenzhen, which was preparing to launch a BRT line. After working closely with Lu and the MAP team for more than three years, Shenzhen electrified 100% of its bus fleet in 2019.

"Thanks to what we learned from FedEx, we are developing a thorough review of e-bus asset management and operations," said Lu, now a transport analyst for WRI China. "We're giving cities the facts they need to give citizens the best possible transport options."

The Promise of Public Transportation: Challenge and Opportunity

Efficient, sustainable and high-quality mass transit is crucial to addressing three of the top issues affecting cities: climate change, equity and health. If we can engage cities in developing better ways for people to move, we can simultaneously lower carbon emissions, increase people's access to jobs and education, and improve urban air quality. Furthermore, we can ease the congestion that cripples city centers and create safer streets for everyone.

Electrifying public bus fleets globally, a particular focus of MAP, is one way to accomplish these goals. MAP is assisting cities in rolling out new bus fleets and improving services. At the same time, we are transplanting successful local projects to new contexts and making the process available to new partners: peer-to-peer forums for transportation administrators and planners, for instance, and apps that include routes, schedules and digital payment options for all modes of transportation.

We know that to build better public transportation, cities need to **change how it's financed.** That's why MAP teams continue to work alongside municipal, state and national governments to craft policies that provide

sustained financing for transit operations and capital investments. This is an immediate need in the wake of the pandemic, when ridership plunged and revenues sank, leaving cash-strapped systems in crisis.

The upfront investment in public transport systems can be considerable, but the social and economic benefits outweigh the costs. A city's attractiveness is largely determined by its ability to provide its people with access to opportunities and a livable and healthy environment, and efficient mobility services are a means to this end. Across the world, cities and nations are seizing the moment and focusing on transportation as an essential component of sustainable growth.

MAP's success during the next decade will depend on our ability to catalyze change in a risk-averse industry, and we're well-placed to do so. MAP provides a laboratory for innovation, applying research to real-world problems and sharing the results with a global network. With FedEx support, we're committed to transforming public transport and moving the planet toward a more sustainable future.



MAP 2022 Annual Report

During the past year, MAP delivered on the promise of public transportation.

Thanks to FedEx, our experience and outreach continued to broaden and we supported major initiatives for sustainability in the countries where we work.

The government of India announced its intention to procure **50,000 e-buses by 2030**

30 Brazilian transport agencies representing **16.5 million daily riders** collaborated on best practices and quality of service metrics

Mexico and India issued **national-level policy recommendations** for transit financing

Three Brazilian cities dedicated on-street parking revenues to **fund public transit**

Urban planners in Guadalajara boosted safety, walkability and transit use with **street design guidelines**

4.5 million people in China used the new MaaS program to choose a sustainable mode of travel



An electric BRT bus is shown off in Salvador, Brazil.

MAP in Brazil 2022

QualiÔnibus, MAP's national platform for transportation professionals to share solutions and establish benchmarks for best practices, has more than tripled its membership in five years of existence. Now a highly visible forum of 30 member cities, it has reached full capacity with new candidates on the waiting list. Demand for the program continues to increase as transit agencies and operators incorporate QualiÔnibus insights into their agendas.

Customer satisfaction remains an important gauge of quality transportation for QualiÔnibus members and the group champions the use of satisfaction surveys to measure progress. In 2021-22, that trend took root as official policy, with agencies in Porto Alegre, Salvador and Rio de Janeiro requiring the submission of customer satisfaction indicators, benefiting 3.8 million daily riders.

In 2022, QualiÔnibus continued to appraise the success of an Enhanced Bus Stop pilot project. The project, begun in 2019, aimed to improve the safety and comfort of bus stops in Fortaleza, Brazil. The QualiÔnibus satisfaction survey allowed the city to see results that went far beyond the primary metric of ridership. By collecting data on customers' experiences, the survey found that the project increased users' feelings of security by 30% and improved comfort by 59%. The project highlights the importance of assessing the impact of transportation amenities on user experience and serves as another template of best practices for QualiÔnibus members.

Finally, an innovative municipal finance policy to boost resources for transit was adopted by the municipal governments of two more cities in 2022. The policy directs revenues from on-street parking to public transportation, providing much-needed support for strapped urban systems. Brazil's MAP team led the way in 2021 by conducting a deep-dive workshop on the parking policy of São José dos Campos, as well as other international experiences. After calling on the participant cities to take action and plan for a much-needed change, local administrators in Porto Alegre and Novo Hamburgo agreed to adopt the policy and commit increased parking funds to transit. The plan has forecast R\$20 million (US\$3.95 million) for improvements in the two cities. Other cities are watching the results: this system was highlighted in Mexico at an international best-practices seminar for transportation professionals in early 2023.

QualiÔnibus continues to demonstrate its impact as a clearinghouse for tools and other transit innovations. In November 2022, more than 130 participants from 30 cities met in the city of Salvador to mark the group's fifth anniversary, with FedEx representatives in attendance.

**Thanks to MAP,
three Brazilian
cities — Porto
Alegre, Salvador
and Rio de Janeiro
— will now require
the submission of
customer satisfaction
indicators
for municipal
transportation
contracts or
government plans.**



Shared bikes, which are an option in the MaaS pilot, go by in Beijing, China.

MAP in China 2022

Despite lockdowns caused by COVID during 2022, MAP's China team made strides in broadening the national understanding of a new concept: Mobility-as-a-Service (MaaS). MaaS integrates various forms of transport services – mass transit, shared vehicles, bike sharing and more – into a single digital platform to simplify access to transport without needing a car. With features such as one-stop travel planning and payment, it meets users' needs and provides efficient, low-carbon travel solutions that increase the number of green trips and promote sustainable transportation. MaaS pilots in Beijing and Guangzhou enabled more than 4.5 million users to switch at least one trip to greener modes.

MAP presented a comprehensive report on MaaS for administrators of transit agencies across China in December 2022, providing guidelines on MaaS and discussing the implications for transit planning. It followed up with an online workshop on the topic attended by more than 75 transportation professionals. Subsequent meetings with stakeholders at North China University provided further opportunities to influence the future of sustainable transportation across some of China's largest cities.

Ongoing exchanges with international associations, such as the MaaS Alliance in Europe, have allowed WRI China to distribute its findings on the shared mobility landscape and learn from an international community of practitioners. "Shared mobility has emerged as an important alternative to private vehicle use and an essential component of public transportation, both inside cities and between cities," said WRI China's Su Song, a 2019 WRI Fellow Participant, who manages its MaaS program.

The MAP team achieved a long-time goal of establishing a collaboration with the Beijing Transport Research Institute in 2022. As the nation's leading transportation think tank, the institute will assist in designing Green MaaS 1.0 and 2.0, building a MaaS development strategy and connecting MaaS with the carbon market. Throughout the year, the team helped 20 Chinese cities conduct user surveys, delivering comprehensive data on customers' experiences, attitudes and expectations for MaaS and shared mobility.

**Shared mobility
emerged as an
important alternative
to private vehicle use.**



Over 5,000 e-buses like this one are about to be deployed all across India, with thousands more in the coming years.

MAP in India 2022

With key support from FedEx, WRI India's Bus Karo program helped municipal transit authorities begin a major transition in 2022: the deployment of 5,450 e-buses in five cities. The US\$675 million tender offer approved by the national government in January 2022 was the culmination of a four-year effort by the MAP team, launching a new era of transportation in Delhi, Bengaluru, Hyderabad, Kolkata and Surat.

The new e-buses are expected to save 1.88 billion liters of fossil fuel over 12 years of operation. They will reduce at least 3.31 million tons of CO₂e from tailpipe emissions, a major step toward mitigating climate change. And they will create employment opportunities for at least 25,000 people, at least 10% of whom will be women, with additional jobs generated by new manufacturing facilities.

Evidence-based research and in-depth insights provided by WRI India persuaded officials to open up the tender to multiple players, including electric vehicle equipment manufacturers, operators and financing agencies, and encouraged public bus agencies to augment their services and optimize operations. Working with stakeholders, our team prepared technical specifications for the tender that incorporated global best practices and helped to establish a common platform for industry, financing agencies and public bus agencies to work out differences.

With e-buses now recognized as a breakthrough solution in major urban areas, the government of India has announced its intention to procure 50,000 by 2030. WRI will continue to support the mission of the National Electric Bus Program over the next seven years, working with our well-developed network of transit authorities to realize the goal of moving people efficiently and sustainably.

Simultaneously, the Bus Karo team is working with transportation professionals in 22 cities to align local and regional initiatives with national goals. WRI experts are collaborating with officials to analyze data on changing travel patterns and demands, suggest route changes, and respond to each city's unique social and geographic needs.

In Bengaluru, Bus Karo has conducted data analyses to help the government understand new travel patterns post-COVID. This initiative helped the city to restart routes based on the data as offices reopened and inter-city travel restarted. The twice-yearly forums sponsored by Bus Karo draw hundreds of attendees and are regarded as a unique opportunity for bigger cities to share their experiences with smaller ones and receive direct training on FedEx management tools.

With e-buses now recognized as a breakthrough climate solution, the Indian national government announced its intention to procure 50,000 by 2030.



David Zamora Bueno, Secretary of Infrastructure and Public Works, and Governor Enrique Alfaro Ramírez, both from State of Jalisco, show off the Guide for Safe and Walkable Environments developed by MAP.

MAP in Mexico 2022

MAP extended its impact at both the federal and local levels in Mexico in 2022, helping governments deploy new approaches to improve transport operations. In the capital, it issued a detailed proposal for a new national financing program for public transit, which has experienced severe losses as a result of the pandemic.

MAP's proposal focused on the actions needed to reactivate Mexico's transportation sector and we generated widespread support for improvements in vehicles, technology and infrastructure. It was championed by the Mexican Association of Mobility Authorities (AMAM), a coalition of state and municipal governments that MAP helped to establish in 2017. To provide context for the plan, WRI Mexico published Economic Impacts of the COVID-19 Pandemic on Urban Public Transport in Mexican Cities, a working paper that assessed the financial effects of COVID. The document, shared with government policymakers, discussed reactivation priorities and highlighted the need for economic, social and environmental sustainability.

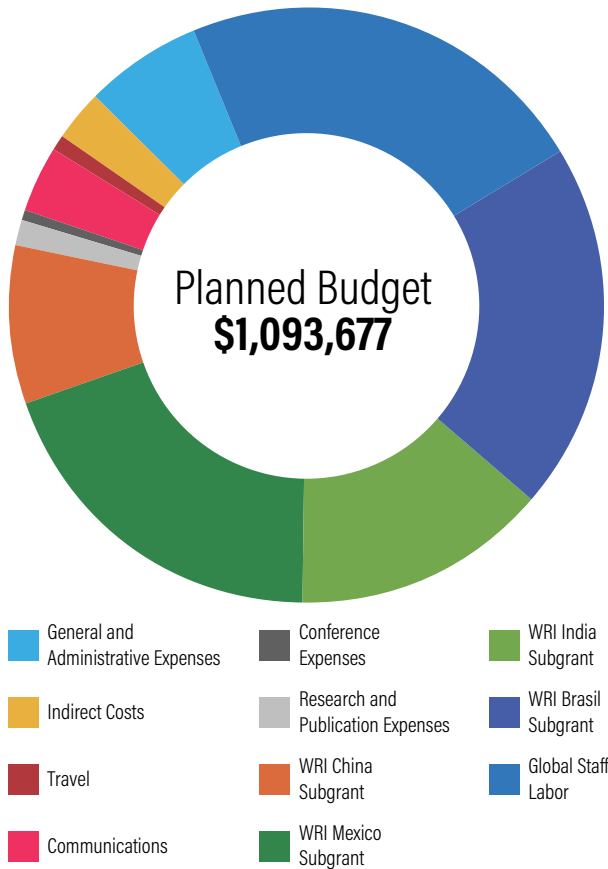
After pandemic losses, MAP proposed a new national financing program for public transportation

In other actions, Mexico's MAP team defined and tested measures and designs intended to improve street safety and livability in urban communities, particularly in mid-sized cities. The resulting Guide for Safe, Walkable Environments targeted improved access to urban facilities and transportation, as well as the creation of enhanced public spaces.

Drawing on a spatial analysis of schools, parks, markets and health centers in Guadalajara, Jalisco, WRI experts made recommendations for efficient public transportation, pedestrian and cyclist safety, and traffic-calming measures. Initial interventions were proposed for streets and neighborhoods around schools, and the team is now advising on the preparation of technical guidelines for the maintenance, design and redesign of Safe School Environments across the state. Criteria from the guide have been incorporated into upcoming light BRT projects that are set to begin construction in Chapala and Colón in late 2023.

At the invitation of the state of Sonora, WRI experts continue to work with the state Institute of Mobility and Transport to increase its capacity for integrating new management tools and data across the transport system.

Financial Statement



Project Expenses (March 2022–2023)

Salaries	\$172,088
Benefits	\$79,565
Occupancy	\$18,136
Project Related Office Services & Supplies	\$6,151
Conference Expenses	\$171
Publications	\$6,675
Communications	\$8,418
Travel	\$1,305
Project-Related Electronic Network	\$14,644
Research Materials & Quality Assurance	\$6,475
Subgrants ¹	\$548,172
Other Direct Costs ²	\$1,162
G&A ³	\$65,351
Total Project Expenses	\$928,413

1. Subgrants to WRI Mexico, WRI Brasil and WRI India.
2. Includes a small GHG tax from business travel and electricity use.
3. 5% of the funds received from all corporate grants are used for implementing WRI's core operations which help ensure the success of our overall programs.
4. General and Administrative Expenses: Organization-wide shared costs including senior leadership, accounting, grant and subrecipient management, human resources, web management, audit and related services.
5. This line includes expenses for the DC-based MAP project management team, which coordinates the global efforts of the in-country MAP teams.

ABOUT FEDEX

FedEx Corp. (NYSE: FDX) provides customers and businesses worldwide with a broad portfolio of transportation, e-commerce and business services. With annual revenue of \$90 billion, the company offers integrated business solutions through operating companies competing collectively, operating collaboratively and innovating digitally as one FedEx. Consistently ranked among the world's most admired and trusted employers, FedEx inspires its 530,000 employees to remain focused on safety, the highest ethical and professional standards and the needs of their customers and communities. FedEx is committed to connecting people and possibilities around the world responsibly and resourcefully, with a goal to achieve carbon-neutral operations by 2040. To learn more, please visit fedex.com/about.



ABOUT WRI

World Resources Institute (WRI) is a global research organization that works with partners in more than 50 countries, with national offices in Brazil, China, India, Indonesia, Mexico and the United States, regional offices in Ethiopia (for Africa) and the Netherlands (for Europe), and program offices in the Democratic Republic of Congo, Turkey and the United Kingdom. Our more than 1,400 experts and staff turn big ideas into action at the nexus of environment, economic opportunity and human well-being. More information at www.wri.org.



WORLD
RESOURCES
INSTITUTE

ABOUT WRI ROSS CENTER FOR SUSTAINABLE CITIES

WRI Ross Center for Sustainable Cities is World Resources Institute's program dedicated to shaping a future where cities work better for everyone. It enables more connected, compact and coordinated cities. The Center expands the transport and urban development expertise and on-the-ground impact of the EMBARQ network to catalyze innovative solutions in other sectors, including air quality, water, buildings, land use and energy. Our network of more than 400 experts working from Brazil, China, Colombia, Ethiopia, India, Kenya, Mexico, Turkey and the United States combine research excellence with on-the-ground impact to make cities around the world better places to live. More information at www.wrirosscities.org or on Twitter @WRIRossCities.

ACKNOWLEDGMENTS

This report was written and edited by Adam Davidson, Carol Denny, Sarah Cassius, and Anna Kustar with support from the WRI international offices. The authors thank the following individuals for their valuable contributions and support: Brandon Tidwell, Perrin Crews, Ben Welle, Cristina Albuquerque, Guillermo Petzhold, José Juan Hernández, Carlos Orozco, Sudeept Maiti, Ranjith Parvathapuram, Su Song and Lulu Xue. Publication and design support were provided by Billie Kanfer and Romain Warnault. Lastly, the authors thank Eric Schulthess for administrative support.

MAP's Impact Expands

Thanks to over a decade of continued support from FedEx, MAP has directly improved the public transit experience of more than 18 million people in these cities:

Brazil

Aracaju
Belo Horizonte
Belo Horizonte, Metropolitan Region
Brasília
Blumenau
Campinas
Contagem
Campos dos Goytacazes
Curitiba
Fetranspor (Rio de Janeiro, Metropolitan Region)
Fortaleza
Goiânia
Joinville
Juiz de Fora
Novo Hamburgo
Palmas
Pelotas
Ponta Grossa
Porto Alegre
Recife
Rio Branco
Rio de Janeiro (city)
Rio de Janeiro (state)
Salvador
Santarem
São José do Rio Preto
São José dos Campos
São Paulo Teresina
Teresopolis
Uberaba
Uberlândia

Chile

Santiago

China

Beijing
Guangzhou
Guiyang
Kunming
Suzhou
Zhuzhou

Colombia

Bogota
Medellin

India

Ahmedabad
Bangalore
Bhopal
Bhubaneswar
Chennai
Delhi
Gulbarga
Gurgaon
Hubli-Dharwad
Indore
Jaipur
Karnataka (state)
Madhya Pradesh (state)
Mumbai
Mysore
Navi Mumbai
New Delhi
Visakhapatnam

Mexico

Guadalajara
Hermosillo
State of Jalisco
Leon
Mexico City
Monterrey
Puebla

Tanzania

Dar es Salaam

Turkey

Istanbul



WORLD
RESOURCES | ROSS
INSTITUTE | CENTER

10 G STREET NE
SUITE 800
WASHINGTON, DC 20002, USA
+1 (202) 729-7600
WWW.WRI.ORG